

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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In the Matter of)	
)	
Amendment of the Commission's Rules)	GEN Docket No. 90-314
to Establish New Personal Communications)	ET Docket No. 92-100
Services, Narrowband PCS)	
)	
Implementation of Section 309(j) of the)	PP Docket No. 93-253
Communications Act – Competitive Bidding)	
Narrowband PCS)	

COMMENTS OF MOTOROLA, INC.

I. Introduction/Summary

Motorola, Inc. ("Motorola"),¹ hereby submits these comments in response to the Further Notice of Proposed Rule Making ("*Further Notice*") adopted by the Commission on April 17, 1997, in the above-captioned proceeding.² In the *Further Notice*, the Commission proposes various rules – and rule changes – to be used to govern the issuance of the remaining narrowband personal communications services ("PCS") licenses and the future operations of new and existing narrowband PCS licensees.

¹ Motorola is a leading provider of wireless communications, semi-conductors, and advanced electronic systems and services. Major equipment businesses include cellular telephone, two-way radio, paging and data communications, personal communications, automotive, defense, and space electronics, and computers. In addition, communication devices, computers, and millions of other products are powered by Motorola semi-conductors.

² *Amendment of the Commission's Rules to Establish New Personal Communications Services, Narrowband PCS, Implementation of Section 309(j) of the Communications Act – Competitive Bidding, Narrowband PCS*, FCC No. 97-140 (April 23, 1997) [hereinafter *Further Notice*].

Motorola applauds the Commission's effort to formulate rules and policies that will help create greater efficiencies in the use of narrowband PCS spectrum, reduce regulatory burdens on narrowband PCS licensees, promote competition, and facilitate the provision of narrowband PCS offerings to the greatest number of end users.³ At the same time, however, it is imperative that the Commission exercise caution to ensure that the rules and policies it devises do in fact promote the successful development of narrowband PCS offerings and are responsive to the needs of narrowband PCS licensees and the demands of consumers.

In particular, in answer to the Commission's request for comment on specific proposals contained in the *Further Notice*, Motorola offers the following suggestions:

- First, Motorola opposes the use of service areas based on Major Economic Areas ("MEAs"). Use of MEAs at this juncture would create inconsistencies in the service area boundaries of existing and new licensees and frustrate licensee efforts to aggregate spectrum, form consortia, and enter into roaming agreements over contiguous coverage areas.
- Second, this is not the appropriate time for channelizing and licensing the reserve narrowband PCS spectrum. Because narrowband PCS operations are still in nascent stages, it is simply too early for an accurate assessment of how these services will develop or the making of meaningful decisions concerning the best way to license the reserve spectrum.
- Third, in order to preserve the effectiveness of two-way paging operations, it is critical that the Commission retain the existing restriction limiting use of the paging response channels to mobile-to-base transmissions. Consistent with the recommendations contained herein, the Commission should, however, permit limited operation of "land stations" on these channels.

³ See *Further Notice*, ¶ 2.

II. Background

In 1993, the FCC allocated 3 MHz of spectrum for narrowband PCS operations.⁴ The Commission deliberately fashioned a broad definition of "PCS" to avoid foreclosing innovative uses of this spectrum.⁵ In accordance with this goal, the Commission expects narrowband PCS services to include advanced voice paging, two-way acknowledgment paging, data messaging, and one-way and two-way messaging and facsimile services.⁶

To date, the FCC has granted ten nationwide narrowband PCS licenses and a total of thirty regional narrowband PCS licenses. The nationwide and regional auctions were concluded in July and November of 1994, respectively. Operations on this spectrum are still in early stages of deployment, although several licensees expect to launch commercial services imminently. Significantly, many of these entities plan to use advanced paging protocols, infrastructure equipment, and end user devices developed by Motorola, such as the company's FLEX™, ReFLEX™, and InFLEXion™ high-speed wireless transport systems for nationwide, regional, and local voice and data services.⁷

⁴ *Amendment of the Commission's Rules to Establish New Narrowband Personal Communications Services*, 8 FCC Rcd 7162 (1993) [hereinafter *Narrowband PCS First Report and Order*].

⁵ *Id.* at 7164.

⁶ *Id.* at 7162.

⁷ Motorola's FLEX™ family of protocols, including FLEX™, ReFLEX™, and InFLEXion™, offers different services, capacity, and price points depending on the needs and requirements of individual service providers. The FLEX™ technology is a multi-speed, high-performance paging protocol that provides significantly increased capacity and is designed to co-exist with other protocols. ReFLEX™ is the world's first two-way advanced messaging protocol and provides the foundation for the world's only commercially deployed narrowband PCS

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As indicated in the *Further Notice*, auctions have not yet been conducted for narrowband PCS spectrum currently designated for licensing in 51 Major Trading Areas (“MTAs”) and 493 Basic Trading Areas (“BTAs”), or for 204 MTA licenses and 1,968 BTA licenses designated as unpaired response channels.⁸ This spectrum, plus an additional one MHz of reserve narrowband PCS spectrum, is the focus of the *Further Notice*. In particular, the *Further Notice* seeks commenters’ views on, *inter alia*: (1) whether the service areas of the remaining narrowband PCS channels should be expanded by eliminating BTA licensing and, instead, using a combination of MTAs, regional licensing areas, and nationwide licensing, or some other combination of service area sizes, such as MEAs;⁹ (2) whether the one MHz of reserve spectrum should be channelized and licensed at this time and, if so, what channelization plan should be used;¹⁰ (3) whether the existing restrictions on eligibility and permissible transmissions on the narrowband PCS response channels should be lifted;¹¹ (4) whether the existing construction and minimum coverage requirements for previously-licensed and as-yet unlicensed narrowband PCS spectrum should be modified;¹² (5) whether the auction rules applicable to as-yet unlicensed

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system. InFLEXion™ is a high-speed advanced messaging protocol that enables the transmission and storage of voice and complex data messages.

⁸ *Further Notice*, ¶ 8.

⁹ *Id.*, ¶ 31.

¹⁰ *Id.*, ¶ 34.

¹¹ *Id.*, ¶ 40.

¹² *Id.*, ¶¶ 44-47.

narrowband PCS spectrum should be modified in various respects;¹³ and (6) whether the rules should be amended to permit narrowband PCS licensees to partition and disaggregate their spectrum in a manner similar to that recently adopted in the broadband PCS context.¹⁴

As mentioned, Motorola is offering these comments on three primary issues raised in the *Further Notice*, namely: (1) Motorola opposes reconfiguring the service areas of as-yet unlicensed narrowband PCS spectrum on the basis of MEAs; (2) Motorola urges the Commission not to license the one MHz of reserve spectrum at this time; and (3) Motorola recommends retention of the restriction limiting use of the narrowband PCS response channels to mobile-to-base transmissions, but urges the Commission to allow limited use of “land stations” on these channels. These recommendations are discussed in greater detail below.

III. The Commission Should Not Issue Future Narrowband PCS Licenses On The Basis of Major Economic Areas (“MEAs”)

In the *Further Notice*, the Commission concludes that the record compiled in response to the agency’s *Competitive Bidding Third Memorandum Opinion and Order and Further Notice of Proposed Rule Making*¹⁵ supports reconfiguration of the service area size of the remaining narrowband PCS channels.¹⁶ In particular, the Commission notes the concern of several commenters that BTA service areas are too small to provide a viable narrowband service. In

¹³ *Id.*, ¶¶ 48-83.

¹⁴ *Id.*, ¶¶ 96-99.

¹⁵ *Implementation of Section 309(j) of the Communications Act – Competitive Bidding, and Amendment of the Commission’s Rules To Establish New Narrowband PCS*, 10 FCC Rcd 175 (1994).

¹⁶ *Further Notice*, ¶ 29.

addition, the Commission states that, in its experience, larger licensing areas may be more suitable to the actual configuration of narrowband PCS systems. On this basis, the Commission proposes to eliminate all BTA licensing and instead use a combination of MTAs, regional licensing areas, and nationwide licensing.¹⁷ In conjunction with this proposal, the Commission specifically asks commenters to discuss the relative merit of issuing future narrowband PCS licenses on the basis of Major Economic Areas (“MEAs”) as opposed to MTAs.¹⁸

Motorola opposes converting to MEA-based service areas at this point in the narrowband PCS licensing process. As the Commission itself acknowledges, previously-licensed regional narrowband PCS systems were configured through the aggregation of MTAs into larger regional areas.¹⁹ As such, switching at this juncture to MEAs would not only create inconsistencies between regional narrowband PCS boundaries and MEA-based boundaries,²⁰ but would also frustrate efforts between existing and future licensees to aggregate additional spectrum, form consortia, and enter into roaming agreements over contiguous coverage areas. Motorola does not believe that the Commission intended such a result, particularly when the agency has not proffered any reason for using MEA-based as opposed to MTA-based service areas.

¹⁷ *Id.*, ¶ 31.

¹⁸ *Id.*

¹⁹ *Id.*

²⁰ In the *Further Notice*, the Commission states that “[u]sing MEAs would cause some license inconsistencies between regional narrowband PCS boundaries and MEA-based boundaries.” *Id.*

IV. Channelization And Licensing Of The Narrowband PCS Reserve Spectrum At This Time Would Be Premature

Although Motorola believes that narrowband PCS operators will eventually require access to the one MHz of spectrum reserved for narrowband PCS operations and strongly supports ear-marking this spectrum for its intended purpose, narrowband PCS operations are simply not sufficiently mature to allow an informed and meaningful decision concerning the best channelization plan for the reserve allocation at this time. Accordingly, Motorola urges the Commission to abandon its tentative conclusion that "the one MHz of [narrowband PCS] spectrum . . . reserved in the *PCS First Report and Order* should now be channelized and licensed."²¹

As noted in the background section of this pleading, narrowband PCS operations are only in the nascent stages of development. In fact, many narrowband PCS systems are still conducting tests and have not actually begun offering commercial services. Most operators that have launched systems currently provide service in only a few discrete markets, and thus, are not yet fully deployed. As such, it is impossible to determine how these offerings will develop, what types of applications the market will and will not support, and, as a result, the most effective way to channelize and license the remaining one MHz of spectrum allocated for narrowband PCS. Rather than channelizing and licensing this spectrum hastily, the better course is for the Commission to allow narrowband PCS operations more time to develop and then make informed and well reasoned decisions based on the types of services demanded by the public and the spectrum needs of narrowband PCS operators.

²¹ *Further Notice*, ¶ 34.

V. The Commission Should Retain The Existing Restriction Limiting Use Of The Narrowband PCS Response Channels To Mobile-To-Base Transmissions, But Should Permit Limited Operation of “Land Stations” On These Frequencies

Finally, Motorola supports retention of the existing restriction limiting use of the narrowband PCS response channels to mobile-to-base transmissions. In the *Narrowband PCS First Report and Order*, the Commission noted “general agreement among the commenters . . . that the 901-902 MHz band should be used for low power ‘talk-in’ (mobile-to-base) operations.”²² In addition, the Commission quoted Motorola as having “stat[ed] that commenters have recognized the potential engineering and cost benefits of reserving the 901-902 MHz band exclusively for low power talk-in channels,” and indicated that “many . . . parties support providing for some asymmetrically paired blocks (a mobile-to-base block of smaller bandwidth than the base-to-mobile block).”²³ The Commission adopted the restriction limiting transmissions on the response channels to mobile-to-base on the basis of these comments.²⁴

In the *Further Notice*, the Commission now proposes to lift the restriction limiting use of the response channels to mobile-to-base transmissions provided that licensees comply with applicable rules governing maximum transmitter power and interference.²⁵ The *Further Notice* does not set forth any reasons or rationale in support of this suggestion, nor does it address the technical ramifications of such a rule change. In point of fact, response channels are critical to

²² *Narrowband PCS First Report and Order*, 8 FCC Rcd at 7165.

²³ *Id.*

²⁴ *Id.*

²⁵ *Further Notice*, ¶ 40.

the future of the paging industry. As the entire paging community begins to see the success of two-way paging and the economic advantages of two-way paging offerings, a majority of one-way paging carriers will desire to add response channels. Currently, 1 MHz of inbound channels is expected to support 2 MHz of outbound channels in the narrowband PCS spectrum. If the 900 MHz Part 90 and Part 22 spectrum is taken into account, then the 1 MHz of inbound spectrum must support up to 4 MHz of outbound spectrum. As spectrum bandwidths are related to traffic and as the outbound to inbound bandwidth ratios are expected to increase from 2:1 to 4:1, the result may exceed the normal asymmetry of the paging carrier traffic mix. Also, these bandwidth ratios are based only on the 900 MHz paging bands and do not include other outbound paging spectrum.

If the restriction limiting operations on these channels to mobile-to-base transmissions were removed, the future growth of two-way paging would be seriously jeopardized. Outbound paging channels are much more valuable and can be used for many more purposes when paired with an inbound channel for two-way paging. The advantages of response channels include: (1) greatly increased outbound traffic capacity due to location registration and targeted message delivery; (2) improved outbound reliability due to mobile acknowledgment; (3) confirmation of outbound message delivery to the sender; and (4) enablement of mobile message initiation. Moreover, **allowing base** transmissions on response channels would result in increased interference to **other** mobile-to-base transmissions. Because base transmitters typically use high duty cycles of transmission and greater antenna heights, other narrowband PCS users are likely to experience significantly greater interference resulting in "holes" in inbound coverage. For all of these reasons, Motorola opposes use of the response channels for base-to-mobile transmissions.

Current rules limit transmission on response channels to mobiles. However, the rules should not preclude the use of "land stations" as defined in Section 2.1 of the Commission's Rules, 47 C.F.R. § 2.1, *i.e.*, "[a] station in the mobile service not intended to be used while in motion." Narrowband PCS applications may include low duty cycle transmissions of status or data from remote devices, such as a meter reading application. The characteristics of these types of transmissions are consistent with those of other mobiles in the band, and thus, will not create undue interference to other mobile-to-base transmissions. Accordingly, Motorola recommends that such "land station" operations be allowed on the paging response channels if they meet specific criteria intended to minimize interference to other mobile-to-base transmissions. The recommended criteria to this end are: (1) mobile service only; (2) antenna height of less than 25 feet above average terrain; and (3) any other necessary criteria, such as low power restrictions, consistent with this intent.

VI. Conclusion

Motorola urges the Commission to formulate narrowband PCS rules consistent with the recommendations set forth above, which are aimed at increasing the responsiveness of the

agency's rules and policies to the needs of narrowband PCS operators and members of the public.

Respectfully submitted,

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